KAJIMA News & Notes

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Next-Generation Broadcasting Center

Fuji Television Building Opens

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Construction of Fuji Television's new headquarters—the Fuji Television Building—in the waterfront area of Tokyo's Minato district has been completed, and broadcasting from the new location commenced at the end of March 1997. The new building adds to the dynamic skyline and is a superb complement to the architecturally innovative buildings of the waterfront area. More than just a building with a unique design, the new headquarters houses a high-profile next-generation broadcasting center with an eye to the future. The building, which in many ways captures the essence of what's best about Japan, has quickly attracted attention and thus a crowd of visitors and is destined to become a Tokyo landmark.

A New Landmark in the Heart of Tokyo's Waterfront Area

The new Fuji Television Building can be seen from the recently opened Yurikamome monorail that leaves from Shimbashi station. On the left side of the new headquarters is the media tower, which is also home to the Nippon Broadcasting Company, and on the right is the office tower. Between the towers

is a group of large studios arranged side by side. The media and office towers are connected by three enclosed pedestrian bridges dubbed "sky corridors."

The headquarters has 25 aboveground and 2 underground floors. Just to the left of the media tower is a unique spherical observation platform, with 53 square meters of floor space and a 32-meter diameter. The building stands 123.45 meters high and comprises a total floor space of 142,800 square meters. Construction began in May 1993 and was completed in June 1996. The project totaled nearly ¥185 billion, with construction costs coming in at ¥130 billion.

An important consideration when designing this kind of building is ensuring adequate space for people to gather and exchange ideas. The headquarters' 4.8-meter-wide corridors provide not only convenient walkways but valuable space for casual talk and impromptu discussion. The building's design emphasizes space and openness, which are important concepts to the image that Fuji Television wants to project. Kajima engineers used the "Mast Column" construction method, which features four steel-frame pillars grouped together, symbolic of the consolidation of our group companies, each supporting the other.

In addition, the corridors connecting the two towers strengthen the structure, making it highly earthquake resistant.

Spherical Observation Platform Open to the Public

The design of Fuji Television's new broadcasting station, located within the headquarters, emphasizes the company's concept of openness. Now open to the public, the spherical observation platform is certain to become a popular spot from which visitors can view the city. To the west are unobstructed views of such landmarks as Tennouzu-Isle, the NEC Corp. headquarters, Tokyo Tower, the Tokyo Metropolitan Government Office, and St. Luke Garden as well as a glorious view of Mt. Fuji at dusk. The water provides a relaxing backdrop, and the night view of Tokyo is spectacular.

Raising the observation platform into position was a major task for the crew; besides weighing 1,350 tons, the platform's center of gravity is not at its core. Two or three options were considered, but in the end it was decided that the platform would be constructed on the rooftop garden of the seventh floor, where it was balanced horizontally on and supported by three beams, and then raised by hydraulic jacks. On the day the platform was raised—a beautiful day with almost no wind—around 1,300 people, including Hisashi Hieda, president of Fuji Television, and Kenzo Tange of Kenzo Tange Associates, the firm that designed the building, were in attendance.

Divided into two phases, at a rate of five meters per hour, the raising of the platform took a total of nine and a half hours.

The observation platform's external surface is salt air damage resistant titanium that features an appealing reflective finish with a crisp color that is pleasant to the eye. Aluminum curtain wall was used for the outside walls of the

building to project a transparent image in line with the idea of a broadcasting center open to new ideas and the public.

Although the new building has less floor space than the 36-story Kasumigaseki Building, which at one time was a Tokyo landmark, the complex design of the new Fuji Television Building has resulted in an outer wall area three times greater than that of the earlier building, which has a standard four-wall design. The construction of the exterior of the headquarters presented a few problems, so we enlisted the help of 10 curtain-wall makers and unified the management team.

Making the Most of Acoustic Design

A great deal of time and energy went into creating the broadcasting studios, which were designed for state-of-the-art functions. One of the challenges we faced along the way was that of acoustics. In this new multimedia and multichannel era, high-definition television is becoming the norm, and with the change from analog broadcasting to digital, the need to transmit large quantities of information is more important than ever. In addition, viewers have become more quality-conscious as well as more astute in recognizing quality sound. For this reason, such facilities as tilted cycloramas, the walls used by studios for backdrops, were introduced to deliver the best sound available.

The studios were designed to shut out the noise of trains, cars, escalators, and even radio waves from passing ships. Glass wool insulation was used for the studio floor as well as the walls and ceiling to absorb obtrusive sounds.

The majority of television studios have taken to using two-sided cycloramas, which help to make the background appear infinitely wide and

STEEL-FRAME CASTING AND THE SPHERICAL OBSERVATION PLATFORM PROJECT

Concerns arose during the planning stage of the spherical observation platform's construction, which prompted us to conduct a number of construction simulations. After comprehensive assessment that took into consideration such factors as quality, cost, construction time, and safety, we employed a method by which the structure was built on the seventh floor and then raised to the top corridor level.

The method used to raise the platform can be broken down into four steps, which are summarized below:

1. In order to deal with the platform's uneven weight distribution, we raised the structure by gripping it at three points to counteract its tendency to tilt, the first time this procedure has been attempted by any construction company in the world.
2. We anticipated the load at the heaviest lifting point to be three times that of the other points, and because of the differences in the distance from the sphere's center of gravity to the gripping points, extremely sophisticated technology was required for aligning and controlling the lift.
3. Because the lifting was done in two phases, a fixed step-rod was used to facilitate the raising and lowering by hydraulic jack.
4. To provide the reinforcement needed to support the sphere due to its irregular alignment and unevenly spaced gripping points, diagonal braces and temporary vent equipment were required. The Company also carefully examined the best methods for relieving the excess stress on these temporary structures and worked out how best to remove them once their task was completed, while always emphasizing safety.

The total mass that was raised came to 1,350 tons, which included the platform, steel frame, exterior materials, facilities and equipment, a rotating ladder, and other items. It took nine and a half hours, raising the structure 5,086 millimeters every hour, to lift the observation platform to its highest position and then finally secure it into place.

high. In this new era of wide-screen and high-definition television, Fuji Television decided to go one step further, introducing three-sided cycloramas; however, this caused sound to bounce back and forth between the walls. To deal with this problem, we decided to tilt the walls of the cyclorama inward, although there was a chance the picture could distort and dust gather on the walls. This was the first attempt to tilt the walls of a cyclorama, and numerous sound tests with the walls positioned at varying angles were performed using a scale model one-twentieth the studio's actual size.

With a floor space of 1,000 square meters, the class V4 studios at the new headquarters are Japan's largest. Moreover, studios and sound rooms are being adjoined and there are plans for 150 more rooms. People place great emphasis on sound quality, and there are many areas of sound improvement that have yet to be explored.

Transmitting Information to the World

The Fuji Television Building has become one of the bases for transmitting information to the world. The building will be lit 24 hours a day—a shining beacon that is sure to become an area landmark.

Kajima Breaks Rock Tunnel Boring Records

During early 1997, Kajima Engineering and Construction, Inc. (KEC), broke all five world rock tunnel boring machine (TBM) advance speed records in the 5.01- to 6.0-meter diameter TBM tunnels on the 79th Street water tunnel, in Chicago, Illinois. Of particular note is KEC's best-month record in March, when 1,513 meters into a 5.56 meter diameter tunnel was bored. Earlier, records were broken for the best shift (37.8 meters), best day (98.5 meters), best week (424.3 meters), and the largest volume excavated in 24 hours (2,393 centimeters).

Less than a year earlier, KEC had also captured three of the world advance records in the 4.1- to 5.0-meter diameter TBM tunnels at the River Mountains tunnel no. 2, near Las Vegas, Nevada. During this project, records were broken for the best shift (83.2 meters), best day (150.0 meters), and best week (636.7 meters).

Both tunnels serve to supplement their respective water supplies for areas on the southwest side of Chicago and Las Vegas, cities which are rapidly increasing in population.

Because of the time constraints of the projects and the highly competitive nature of the tunnel construction industry, KEC was unable to have new TBMs manufactured. For both projects, used Robbins TBMs with proven capability were purchased.

To obtain maximum performance, Boretec, in Cleveland, Ohio, and Atlas Copco Robbins, in Seattle, Washington, were chosen to revitalize, enlarge, and upgrade the boring machines—installing new cutterheads with larger, more-productive cutters, increasing power, reducing re-gripping times, and improving internal muck-handling capacity.

Other factors contributing to the two successive record-breaking performances were the use of a horizontal conveyer belt to transport muck without interruption; the availability of quality rock (volcanic at River Mountains tunnel no. 2 and dolomite in Chicago), which required little support and caused minimal delay; and the enthusiastic team of managers, engineers, and tunnel men who made every effort to maximize excavation production.

The Chicago job was similar to the Las Vegas one in many ways—both excavations were about 6,000 meters long and straight; however, Chicago's was a shaft job, whereas the tunnel in Las Vegas was excavated from a portal. Also, in Chicago the shaft was offset 23 meters from the tunnel and required a 206-meter-long tunnel to the west that had to be excavated with a TBM that was assembled at the bottom of the shaft. After assembly, the TBM had to be repositioned 90 degrees in order to mine to the east, following which it was backed out and rotated 180 degrees before excavation on the west tunnel could begin.

Kajima's Brand-New Apartment Complex

Kajima Development Corporation (KDC) developed a luxurious apartment complex in the city of San Ramon, which is located in the suburbs of San Francisco. The complex is named Promontory View and has 306 rental units, which range from 575-square-foot, one-bedroom units to 1,208-square-foot, three-bedroom units. Twelve 3-story residential buildings, and one leasing office and a sports gym are built on this 12 acres of land. Promontory View features a computer-controlled entrance gate, underground parking, a swimming pool, a spa, a fully equipped exercise gym, a playground, a business center, and more. KDC works as the managing general partner of Crow Canyon Developers, Ltd. (CCD), which owns Promontory View.

First-time visitors to the complex are warmly welcomed by well-trained, friendly leasing staff and shown to the model units. Each model presents an accurate image of the units as real living spaces complete with furniture. With finely designed units, a variety of amenities, a great view of the city,

and the warm smiles of our staff, visitors are finding the decision to live in this kind of community an easy one—and they are extremely satisfied living in the complex.

San Ramon has been developing rapidly in recent years with the development and expansion of Silicon Valley—the famous computer-industry center of the United States and the world—which is located a few miles south. This development is why it is perceived that San Ramon will further develop in the future. Promontory View will continue its contribution to San Ramon as a high-profile residential community.

Asia

Senayan Square Project

Central Senayan I Office Tower Topping-Out Ceremony and Plaza Senayan Shopping Center's First Anniversary

The Senayan Square Project, situated in the center of Jakarta, Indonesia's capital city, occupies a site of approximately 18.8 hectares and is being developed on a build-operate-transfer basis, with ownership to be handed over to the government in 2033. Seventy percent of the funds for the project are being provided by Kajima Overseas Asia Pte. Ltd. (KOA), with the management of the project divided between PT. SENAYAN TRIKARYA SEMPANA, in charge of the business zone, and PT. SENAYAN TRIKARYA GRAHA, responsible for the living zone. Plaza Senayan Shopping Center opened to the public in November 1995 and has been a resounding success ever since. At present, the first office tower, a twin tower apartment block, and a second department store are under construction.

On April 6, 1997, the topping-out ceremony for the project's 18-story building was celebrated. The ceremony was attended by firms responsible for the project and other distinguished guests. Vice President Kouchi, representing the developers, lead the celebration with a speech. Kajima's Design and Engineering divisions are in charge of the building's design, and KOA's joint operator, its construction. With the project scheduled for completion in November of this year, rental units are being vigorously promoted.

On April 26, 1997, events were held to celebrate the first anniversary of the Plaza Senayan Shopping Center. Representatives of retailers, local celebrities, including famous Indonesian models, and other distinguished guests joined in the festivities, which were highlighted by the extinguishing of a huge candle erected on stage to mark the end of a successful first year.

The Hanshin Department Store, Ltd., one of the oldest in the Kansai region, will open for business in the Plaza Senayan Shopping Center next spring. In addition, mid-1998 will see the completion of the first twin tower apartment development. Plans are under way for the construction of a second and third block of offices, a second apartment complex, and a hotel.

The Senayan Square Project is part of the constant revitalization of Jakarta's city center as this vibrant capital forges ahead into the 21st century.

Kajima Design Ranked Second in the World by **World Architecture** *Magazine*

Kajima Design, which encompasses the Design Engineering head office as well as each branch office's architectural design department and local architectural design affiliates overseas, was ranked second out of 250 architectural firms worldwide by Britain's *World Architecture* magazine. Vice President Takashi Nakajima was chosen as one of eight representatives of the world's top architectural firms to appear on the cover. Moreover, Kajima Design was ranked number one among the top 30 firms in the category of industrial design.

Kajima has achieved a proud record of performance in the area of industrial design in Japan as well as in Southeast Asia, Europe, and North America and has received high praise from manufacturers the world over. Recent overseas achievements include Seagate's plant in Singapore, Mazda/Ford (AAT)'s Thailand plant, the new Nippon Electric Glass U.K. Ltd. (NEG) plant in Wales, and the new Fuji Photo Film Co., Ltd., plant in North America.

Building and Civil Engineering Divisions of Tokyo, Kanto, and Yokohama Offices Receive ISO 9001 Certification

Kajima is proud to announce that three of its divisions have received the ISO 9001 series certification, an internationally recognized standard for quality control and quality assurance, for everything from design and construction to related services. On March 1, 1997, the building and civil engineering divisions of Kajima's Tokyo office received certification, followed by their counterparts at the Kanto and Yokohama offices and related departments at the head office, which received certification on March 31.

Note: At the Yokohama Office, the Materials Department is separate from the related departments at the head office.

Engineers of the Century Exhibition

Last year, the Georges Pompidou Culture Centre, in Paris, invited Kajima to participate in its Engineers of the Century exhibition, and this has since been the topic of major discussions among relevant departments at Kajima. Considering the scale of the exhibition and its profound influence on the world of civil engineering and architecture, it is indeed a great honor to have been selected from among Japan's general contractors. Given the public relations possibilities, and considering the significance of the event, we are pleased to take part.

The exhibition will be held from June 24 to September 29, 1997, and will feature a wide variety of works by some of the world's greatest structural technicians of the 19th and 20th centuries. The exhibits will include drawings, photographs, scale models, and videos.

Eleven-Story Building Going Up the AMURAD Way

Kajima has developed a fully automated building construction method, AMURAD, where the top floor of a building is constructed first, then raised so that the next floor can be constructed beneath it. This method is being used on the (tentatively named) Yokogawa Construction New Headquarters Project, scheduled for completion in September 1997. In January 1997, the 11th floor section, which is the top floor, was lifted up and secured into position.

By using this new construction method, which is radically different from the conventional method of constructing buildings from the ground up, workers can construct each floor of a building at ground level. Since everything from the lifting of each completed floor to the transport and assembly of materials, such as steel casting, is done automatically, construction time can be reduced 30%, and the number of workers needed and waste materials produced can be reduced 50%.

Note: AMURAD (Automatic up-rising construction by advanced technique)

KAJIMA CORPORATION

Kajima Corporation (Head Office)
2-7, Motoakasaka 1-chome,
Minato-ku, Tokyo 107, Japan
Telephone: 81-3-3404-3311
Facsimile: 81-3-3470-1444/5

Kajima Corporation
(International Division)
28th Floor, Shinjuku Park
Tower Building,
7-1, Nishishinjuku 3-chome,
Shinjuku-ku, Tokyo 163-10, Japan
Telephone: 81-3-5324-5810
Facsimile: 81-3-5324-5815

Kajima U.S.A. Inc.
26th Floor, 320 Park Avenue,
New York, NY 10022-6815, U.S.A.
Telephone: 1-212-355-4571
Facsimile: 1-212-355-4576

Kajima Europe B.V. (London)
Grove House, 248A Marylebone Road,
London NW1 6JZ, U.K.
Telephone: 44-171-465-0007
Facsimile: 44-171-465-8788

Kajima Overseas Asia Pte. Ltd.
80 Marine Parade Road,
#14-01/03 Parkway Parade,
Singapore 449269, Singapore
Telephone: 65-344-0066
Facsimile: 65-344-3777

URL: http://www.kajima.co.jp

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